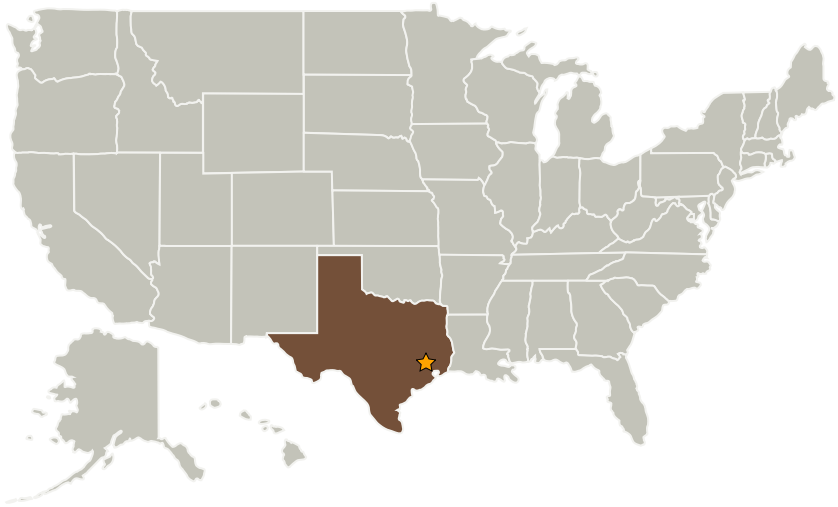
Portable Cathode-Air-Vapor-Feed Electrochemical Medical Oxygen Concentrator, Phase I

Completed Technology Project (2009 - 2009)

Project Introduction

Future space exploration missions present significant new challenges to crew health care capabilities, particularly in the efficient utilization of on-board oxygen resources. The International Space Station and future exploration vehicles require a light weight, compact, portable oxygen concentrator technology (OCT) that can provide medical grade oxygen from the ambient cabin air. Current OCTs are heavy, bulky, have a narrow operating temperature range (ambient to 40 degrees C), and require 15 to 30 minutes start-up time to reach their full operating capacity. Lynntech's proposed electrochemical OCT solves these issues by operating the OCT with a cathode-air vapor feed, unlike conventional electrochemical OCTs which require a liquid water feed. This is possible due to the use of in-house developed proprietary nanocomposite proton exchange membrane and oxygen reduction/evolution catalyst technologies. Cathode-air vapor feed operation eliminates the need for a bulky on-board water supply, significantly reduces the complexity of the balance-of-plant, and greatly increases the system efficiency. Lynntech's OCT will be a quarter the size and weight of conventional OCTs, be capable of instant start-up, and have an operating temperature range of 10 degrees C to 110 degrees C.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Johnson Space Center (JSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
Lynntech, Inc.	Supporting Organization	Industry	College Station, Texas

Primary U.S. Work Locations
Texas

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.4 Environmental Monitoring, Safety, and Emergency Response
    - TX06.4.3 Protective Clothing and Breathing